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09/801,361	03/06/2001	Edward L. Schwartz	74451.P127D5	8077

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EXAMINER
CHEN, WENPENG

ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.		Applicant(s)
	09/801,361		SCHWARTZ ET AL.
	Examiner		**Art Unit**
	Wenpeng Chen		2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .
2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-21_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) _1-21_ is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on _8/29/2001_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☐ All   b) ☐ Some *   c) ☐ None of:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _6_.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____ .

Inventorship

1.   Receipt is acknowledged of the statement, requesting that Edward L Schwartz,

Martin Boliek, and Kok Gi Wu be deleted as named inventors, which was filed on 8/16/2002

(paper #8.) The inventorship has been corrected as requested.

Examiner's Statement

2.   The amendment filed on 10/17/2002 has been entered as paper #10.

Drawings

3.   The drawings are objected to because of the following informalities.

-- The labels are in handwritten form and difficult to recognize.

-- In Fig. 3(a), the numerals "320" and "321" shall be replaced with "310" and "311",

respectively.

Correction is required.

4.   Figure 1 should be designated by a legend such as --Prior Art-- because only that

which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected

drawings are required in reply to the Office action to avoid abandonment of the application. The

objection to the drawings will not be held in abeyance.

Specification

5.   The disclosure is objected to because of the following informalities:

-- In page 49, line 8, the word [times] shall be replaced with - tiles -.

Appropriate correction is required.

Claim Objections

6.   Claims 16-17 are objected to because of the following informalities:

-- Claims 16-17 recite an apparatus defined by method Claims 10-11.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8.   Claims 10-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to

comply with the written description requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to reasonably convey to one skilled in the

relevant art that the inventor(s), at the time the application was filed, had possession of the

claimed invention.

With regard to Claims 10-21, the Examiner found only the following passages to support

the claims in page 79:

> " Coding 4:2:2 and 4:1:1 Data as 4:4:4 Data with Quantization
>
> The JPEG 2000 standard is typically used to handling data in a 4:4:4 format. It is not capable of describing how to
> reconstruct data in 4:1:1 or 4:2:2 formats in a 4:4:4 format for output. In one embodiment, when encoding 4:1:1 data, the
> encoder treats 1 HL, 1 LH and 1 HH coefficients as zero. When encoding 4:2:2 data, the encoder treats 1 HL and 1 HH
> coefficients as zero. Thus, with all information in the extra subbands quantized to zero, a decoder is able to receive the
> codestream in a way it expects. In other words, the encoded data resembles 4:4:4 data that has been heavily quantized."

There is not adequate description to enable a person to follow to make the format

conversion without any ambiguity. It is not clear whether the passage teaches that the encoder

treats 1 HL, 1 LH and 1 HH coefficients as zero for all components or just UV components only.

To the Examiner, converting a 4:1:1 format to a 4:4:4 format is an up-scaling process in UV

components, it cannot be achieved by setting existed, encoded 1 HL, 1 LH and 1 HH coefficients

as zero.

9.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

10.   Claims 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

As explained above, it is not clear that Claims 16-17 recite methods or apparatuses.

Claim Interpretation

11.   For examining Claims 16-17 over the prior art, the Examiner make the following

interpretation:

-- Replace "Claim 11" in line 1, Claim 16 to "Claim 15".

-- Replace "Claim 10" in line 1, Claim 17 to "Claim 14".

Claim Rejections - 35 USC § 102

12.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13.   Claims 1, 4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by

Zandi et al. (UK patent Application GB 2303030 listed in IDS paper #6.)

For Claim 7, Zandi teaches an apparatus (page 12, lines 11-24) comprising:

-- means for applying an inverse wavelet transform to data repeatedly for a plurality of

decomposition levels; (Figs. 3A and 3B, Figs. 5A-D; Figs 16-17)

-- means for clipping, after each application of the inverse wavelet transform, any value

generated as a result of application of the inverse wavelet transform that exceeds a predetermined

range associated with that decomposition level, subband and inverse wavelet transform. (Fig. 17:

page 53, line 8 to page 54, line 11; The output is clipped, for example, to 16 bits that represents a

predetermined range of 0 to 2^{16}-1.)

The above passages also teach the corresponding method of Claim 1.

Zandi also teaches an article of manufacture comprising one or more recordable media

having executable instructions stored thereon which, when executed by the computer to carry out

the recited steps of Claim 4. (page 11, lines 11-23)

14.   Claims 1, 4, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by

Keith et al. (US patent 5,966,465 listed in IDS paper #6.)

For Claim 7, Keith teaches an apparatus (column 5, lines 31-47) comprising:

-- means for applying an inverse wavelet transform to data repeatedly for a plurality of

decomposition levels; (Fig. 3A-3D; column 14, lines 30-52)

-- means for clipping, after each application of the inverse wavelet transform, any value

generated as a result of application of the inverse wavelet transform that exceeds a predetermined

range associated with that decomposition level, subband and inverse wavelet transform. (Fig.

3A-3D; column 14, lines 30-52)

The above passage also teaches the corresponding method of Claim 1.

Keith also teaches an article of manufacture comprising one or more recordable media

having executable instructions stored thereon which, when executed by the computer to carry out

the recited steps of Claim 4. (column 4, line 66 to column 5, line 15)

Claim Rejections - 35 USC § 103

15.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that
the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary
skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the
invention was made.

16.   Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over

JPEG2000 N1646 (JPEG2000 image compression standard described in ISO/IEC JTC1/SC29

WG1 N1646, 16 March 2000) in view of Keith et al. (US patent 5,966,465.)

For Claim 7-9, JPEG2000 N1646 teaches an apparatus (section 6.1; decoder) comprising:

-- means for applying an inverse wavelet transform to data repeatedly for a plurality of

decomposition levels; (section 6.3; transform (annex F))

-- wherein the inverse wavelet transform comprises a 5,3 wavelet transform filter;

(sections F.2.7, F2.8; Section F.8.1.1 teaches a 5,3 wavelet transform filter.)

-- wherein the inverse wavelet transform comprises a 9,7 wavelet transform filter.

(sections F.2.7, F2.8; Section F.8.1.2 teaches a 9,7 wavelet transform filter.)

However, JPEG2000 N1646 does not teach means associated with clipping the recited

values.

Keith teaches an apparatus (column 5, lines 31-47) comprising:

-- means for clipping, after each application of the inverse wavelet transform, any value

generated as a result of application of the inverse wavelet transform that exceeds a predetermined

range associated with that decomposition level, subband and inverse wavelet transform. (Fig.

3A-3D; column 14, lines 30-52)

It is desirable to reduce artifact of reconstructed image data. It would have been obvious

to one of ordinary skill in the art, at the time of the invention, to apply Keith's teaching to clip the

inverse-wavelet-transformed coefficients generated in an apparatus taught by JPEG2000 N1646, because the combination improves quality of the reconstructed image.

The above passages and combination also teach the corresponding methods of Claims 1-3.

Because Keith also teaches an article of manufacture comprising one or more recordable media having executable instructions stored thereon which, when executed by the computer to carry out the steps of the corresponding methods (column 4, line 66 to column 5, line 15), the combination also teaches the articles recited in Claims 4-6.

17.   Claims 10-15 and 18-21 and the interpreted Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over JPEG2000 N1646 (JPEG2000 image compression standard described in ISO/IEC JTC1/SC29 WG1 N1646, 16 March 2000) in view of Kanou et al. (US patent 6,088,062) and Acharya (US patent 6,236,765.)

For Claims 14-15 and the interpreted Claims 16-17, JPEG2000 N1646 teaches an apparatus comprising:

-- means for applying a forward wavelet transform to input data having components in a format to generate encoded data; (section 6.1; coder; page 10; section 9)

-- means for quantizing level 1 coefficients in high-low (HL), low-high (LH) and high-high (HH) subbands, such that the encoded data resembles 4:4:4 formatted data. (section J.9; JPEG prefers a 4:4:4 formatted data.)

However, JPEG2000 N1646 does not explicitly teach that the income image data having a 4:x:x format, where x is not equal to 4.

Kanou teaches that images of various formats exist for displaying in various systems and image data needs to be converted from one format to another format. (column 1, lines 1-68) For

example, there exist a 4:1:1 format and a 4:2:2 format. (For example, see column 14, lines 12-65.)

It is desirable to be able to produce data stream from image data of various formats into JPEG 2000 format to take the advantage of various utilities provided by the new JPEG 2000 standard. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to use the apparatus taught by JPEG2000 N1646 to code image data of a 4:1:1 format and a 4:2:2 format as shown in Kanou, because the combination provides various scalabilities for image data having a 4:1:1 format and a 4:2:2 format.

As taught by JPEG2000 N1646 in section J.9, JPEG prefers a 4:4:4 formatted data. However the combination of JPEG2000 N1646 and Kanou does not teach how to make the forward-wavelet-transformed coefficients derived from into a 4:1:1 format and a 4:2:2 format into a 4:4:4 format.

Acharya teaches:

-- adding a level of coefficients with zero value in all high-low (HL), low-high (LH), and high-high (HH) subbands to double the resolution of the current level in both vertical and horizontal directions. (Figs. 2 and 3; column 5, lines 20-50)

It is desirable to perform the format conversion efficiently. It would have been obvious to one of ordinary skill in the art, at the time of the invention, to apply Acharya's teaching to add level 1 with zero coefficients in all HL, LH, and HH subbands bitstream to generate a 4:4:4 format coded data from a original 4:1:1 format image data in the system taught by the combination of JPEG2000 N1646 and Kanou, because the overall combination performs the format conversion more efficiently. It will be also obvious to one of ordinary skill in the art, at

the time of the invention that, for a 4:2:2 format original image data, it only needs to add level 1 with zero coefficients in only HL, and HH subbands bitstream to generate a 4:4:4 format coded data. Please note that " add level 1 with zero coefficients in a subband bitstream" is the same as " quantizing level 1 coefficients in a subband to zero." The overall combination thus teaches Claims 14-15 and the interpreted Claims 16-17.

The above passages and combination also teach the corresponding methods of Claims 10-13.

JPEG2000 N1646 teaches executable instructions, executed by the computer to carry out the steps recited in the method claims. (procedures in section 6.1 and software in annex J.) It is inherently that there are recordable media that store the procedure or software in the encoder and decoder. Otherwise, the encoder or decoder cannot function. Therefore, the overall combination also teaches the article of manufacture recited in Claims 18-20.

Conclusion

18.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 703 306-2796. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703 308-7452. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular

communications and 703-872-9306 for After Final communications. TC 2600's customer service

number is 703-306-0377.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 703 305-4700.

Wenpeng Chen
Primary Examiner
Art Unit 2624

February 18, 2004